基于网格扫描的实现目标点覆盖的确定性传感器节点部署方法

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摘　要：

论文提出了一种确定性目标点覆盖算法，把目标点所在区域划分为若干正方形网格，从中选择最适合的网格作为下一个节点的放置位置；同时本文引入了概率感知模型，把节点能感知到目标点的最小感知概率值作为整体覆盖水平的评价指标，把节点能感知到目标点的个数及对它们的最小感知概率值作为网格的评价标准。该方法能使用最少的节点实现目标点覆盖并达到要求的总体覆盖水平，且能计算出较优的节点部署位置；对网格边长和感知概率下限的不同取值分别进行仿真实验。实验结果表明，网格边长越小，节点部署位置越精确；感知概率下限取值越大，总体覆盖性能越好，需要的节点越多。

关键词：无线传感器网络，目标点覆盖，节点部署，网格，概率感知模型

A Deterministic Sensor Node Deployment Method with Target Coverage Based on Grid Scan

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Abstract:

The paper proposes a deterministic sensor node deployment method with target coverage based on grid scan. First, divide the area into grids. Then, choose the best grid to place the next sensor. Meanwhile, a probabilistic sensing model is introduced，the least sensing probability with which a node can sense a target is used to measure the whole coverage level, the evaluation of a grid is based on the amount of targets the node can sense and the least sensing probability with which it can sense the targets. The method can use the least nodes to achieve the target coverage , meet the required level of the whole coverage and get better positions for node deployment. Simulation experiments are done with different grid side sizes and different lower limits of sensing probability. Experiment results show that the node position is more accurate when the grid side size is smaller. The higher the lower limit of sensing probability is, the better the performance is, and more nodes are needed.

Keywords: WSNs (wireless sensor networks), target coverage，sensor deployment, grid，probabilistic sensing model.

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